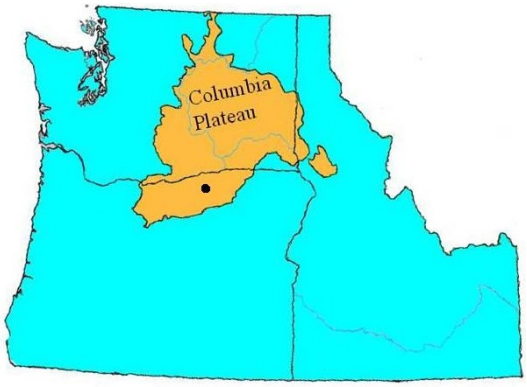
Agricultural Research Service- one of the world's premier scientific organizations.

The Columbia Plateau Conservation Research Center



Location of the Columbia Plateau Conservation Research Center (black dot)

The Agricultural Research Service's Columbia Plateau Conservation Research Center (CPCRC) was established in 1970 near Pendleton, OR. The CPCRC conducts research on dryland agricultural problems in the lower rainfall areas of the inland Pacific Northwest.

Our mission is to serve the public by providing scientific information to improve practices, techniques, and equipment for dryland crop production, and soil and water conservation in the inland Pacific Northwest and related land resource areas.

Resources include 17 federal employees working fulltime at the center with about six temporary employees working summers. The CPCRC has analytical chemistry and microbiological labs, a machine shop for equipment repair and fabrication, and instruments for quantifying runoff, infiltration, erosion, carbon sequestration, gaseous emissions, and other processes. A variety of farm machinery is available for undertaking field research on-site and on neighboring farms. The main building contains office, administrative, and conference spaces.

The main building at the CPCRC

Research activities revolve around providing unbiased findings to land managers in the Columbia Plateau. Major customers and collaborators include growers, agribusinesses, state agencies, federal agencies, universities, Native American Tribes, and others.

Major areas of expertise of the CPCRC's scientists encompass agronomy, soil chemistry, soil physics, hydrology, and microbiology. The lands that are covered by soils that are suitable for winter cereal production are the subject of many of our studies. Data are used, for example, to estimate rates of erosion of soil from steep slopes, quantify emissions of CO2 and other greenhouse gases from soils, and determine the potential for soils to sequester atmospheric carbon.

The Agronomy research effort is developing precision management strategies to accommodate spatial variability in crop production potential within farm fields. Focus is on improving nitrogen input efficiency and enhancing the output of high quality grain from dryland production systems.

Above, an instrumented field-scale research watershed; and right, a science technician is collecting samples of the soil atmosphere

Hydrological and soil erosion projects evaluate cropping practices influence on infield processes, channel initiation and development, sediment transport and stream water quality. Results from this research will provide substantive evidence of the difference in soil and water loss between examples of no-till and conventional inversion tillage management systems.

The Soil Chemistry program is assessing impacts of farming practices on carbon and nitrogen cycling in agricultural systems and is developing management practices to improve soil carbon accretion and soil structure, and reduce plant nutrient losses. The research leads to advanced concepts of organic carbon and nitrogen transformation, carbon sequestration in soil aggregates and their effect on surface soil physical properties.

Soil Physics research has produced a large effort to help farmers exploit positive and avoid negative changes of soil physical and biological factors when tillage is reduced or stopped. Research has studied the effects of surface residue and seed soil contact on germination and crop establishment, effect of tillage on earthworm populations, vertically connected soil pores, soil temperature, water storage, nutrient dynamics, and pH.

Microbiological research is furthering knowledge of biochemical, ecological, and physiological functioning of soil microorganisms, with emphasis on soil carbon and nitrogen dynamics, carbon transformation kinetics, and microbial community function. Soil enzyme-catalyzed biochemical reactions are examined for their role in organic matter decomposition, nutrient release, and other processes. Molecular methods are used to determine the extent and role of microbes in agroecosystem functioning.

Research products of the CPCRC range from interpretive summaries to scientific papers published in peer reviewed journals. Scientists participate as members of review panels and advisory committees, partners on soil and water conservation districts, and lecturers in K-12 and college education efforts.

Left, a combine cuts wheat during harvest; right top, an aerial view of the CPCRC and test plots; and right bottom, soil samples are analyzed with a Gas Chromatograph

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